RDMS DocID 107827

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Former Tri-Star Sports
Facility Address: 475 Smith Street, Middletown, CT 06457
Facility EPA ID #: CTD052544376

1. Has all available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

   __X__ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ if data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near term objectives, which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air media known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	X			Chlorinated VOCs, TPH
Air (indoors)[2]		X		
Soil (surface, e.g., <2 ft)		X		
Surface Water		X		
Sediment		X		
Soil (subsurface e.g., >2 ft)	X			Chlorinated VOCs
Air (outdoors)		X		

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Groundwater

Areas of Concern (AOCs) 1, 6, and 12 have had concentrations of contaminants of concern (COC) in groundwater above Connecticut's Remediation Standard Regulations (RSRs) criteria and/or Media Closure Criteria (MCC). AOC 1, Former Hazardous Waste Storage Area, and AOC 6, Former Raw Chemical Storage Area, have had detections of chlorinated volatile organic compounds (CVOCs) in groundwater during recent groundwater sampling events (Figure 2). Extractable total petroleum hydrocarbons (ETPH) have been sporadically detected in groundwater adjacent to AOC 12, Discharge Point for the Roof Drain Leaders. Remedial measures are complete for AOCs 6 and 12, and monitored natural attenuation per an agreed approach with the Connecticut Department of Environmental Protection is being implemented for AOC 1. A summary of the maximum concentrations detected from sampling events conducted since April 2008 is depicted on the following table:

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[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

COCs Detected Above Applicable Criteria in Past Year

Compound (µg/l)	GWPC	SWPC	I/C VC	MCC	Maximum Concentration (April 2008 to Feb 2009)
1,1-dichloroethane	70	--	41,000	812	**1,300**
1,1-dichloroethene	7	96	920	7	**120**
1,1,1-trichloroethane	200	62,000	16,000	200	**230**
methylene chloride	5	48,000	2,200	5	**7.8**
tetrachloroethene	5	88	810	5	**9.9**
ETPH	100	--	--	--	**120**

Notes:

µg/l = micrograms per liter
GWPC = RSR Groundwater Protection Criteria
SWPC = RSR Surface Water Protection Criteria
I/C VC = 2003 RSR Industrial/Commercial Volatilization Criteria
MCC = media closure criteria
ETPH = Extractable Total Petroleum Hydrocarbons
COCs not compared to residential criteria because the site is used for industrial purposes. An Environmental Land Use Restriction (ELUR) will be recorded to officially restrict residential use.
-- = no criteria established
Bold = exceeds one or more criteria

Subsurface Soil

At AOC 6, Former Raw Chemical Storage Area, concentrations of COCs were previously detected in soil above the RSRs Pollutant Mobility Criteria but below the Industrial/Commercial Direct Exposure Criteria (I/C DEC). Remedial actions have been completed for this area which included excavation and disposal of accessible soils and installation of a soil vapor extraction (SVE) system in areas where contaminated soils could not be removed. A total of 997 tons of soil were excavated and disposed of off-site. The table below presents the maximum CVOC concentrations detected at AOC 6 in soil located beneath the building where it was inaccessible for excavation (prior to SVE system operation). The SVE system operated from March 2007 through August 2008 and a rebound evaluation was completed in the fall of 2008 that recommended that the SVE system remain off except for operating the system once per quarter to check vapor concentrations.

The SVE system rebound evaluation included soil vapor sampling from the SVE wells, which are located throughout the areas of highest contaminant concentrations beneath AOC 6 and the building (see Figure 2). All CVOC concentrations in these samples were below the CT RSR Industrial/Commercial Volatilization Criteria for Soil Vapor. Soil vapor concentrations have exhibited no significant increases during system checks performed in late 2008 and February and April 2009.

AOC 6 - Former Raw Chemical Storage Area

Compound (µg/kg)	I/C DEC	GA PMC	Maximum Concentration	Sample Location	Sample Depth
1,1-dichloroethane	1,000,000	1,400	**2,600**	EX-45	5'
1,1-dichloroethene	9,500	140	**1,100**	DP-6	4-6'
methylene chloride	760,000	100	**660**	DP-32	8-10'
1,1,1-trichloroethane	1,000,000	4,000	**11,000**	EX-45	5'

Notes:

µg/kg = micrograms per kilogram
I/C DEC = Industrial/Commercial Direct Exposure Criteria
GA PMC = Pollutant Mobility Criteria for GA Classified Areas
COCs not compared to residential criteria because the site is used for industrial purposes. An ELUR will be recorded to officially restrict residential use.
-- = no criteria established
Bold = exceeds one or more criteria

References:

MACTEC Engineering and Consulting, Inc. (MACTEC), February 2006, *Phase III Investigation Report.*

MACTEC, September 17, 2007, *Remedial Action Report, AOC No. 6, Former Raw Chemical Storage Area*

MACTEC, June 27, 2008, *Quarterly Groundwater Monitoring Report, August 2007 - May 2008.*

MACTEC, December 3, 2008, *Soil Vapor Extraction Rebound Evaluation*

MACTEC, February 24, 2009, *2008 Annual RCRA Post-Closure Groundwater Monitoring Report.*

MACTEC, May 2008 through February 2009, Groundwater data.

MACTEC, October 2008 through February 2009, SVE system data.

Olin Corporation, 1994, *Identification of Media Closure Criteria.*

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

	Potential Human Receptors (Under Current Conditions)						
Contaminated Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	No	No	No	No	No	No	No
Air (indoors)	--	--	--	--	--	--	--
Soil (surface, e.g., <2 ft)	--	--	--	--	--	--	--
Surface Water	--	--	--	--	--	--	--
Sediment	--	--	--	--	--	--	--
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
Air (outdoors)	--	--	--	--	--	--	--

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media – Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__X__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

_____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

Groundwater

The only risk-based criteria exceeded by COC concentrations in groundwater are the Groundwater Protection Criteria (GWPC) and Media Closure Criteria (MCC), which are both based on risk scenarios involving long-term consumption of groundwater. There is no current use of site groundwater, and the

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

extremely low permeability of the soils (~$1x10^{-6}$ cm/sec) makes future use unlikely. In addition, public water is available and in use in the area of the site.

Subsurface Soil

CVOCs are present in soil at concentrations below the I/C DEC criteria beneath AOC 6, the Former Raw Chemical Storage Area. The location of these soils beneath the building prevents leaching of COCs to groundwater and makes them not subject to PMC. An ELUR will be established to ensure that the soils remain environmentally isolated and are not disturbed without proper precautions.

Concentrations of COCs were also previously detected at concentrations above applicable RSR criteria at three other on-site AOCs (AOC 12, AOC 13 and the Backdoor Spill Area). Along with accessible soil at AOC 6, soils at those areas have been remediated by excavation and off-site disposal, with excavation extent samples collected to confirm removal of soils exceeding criteria. No soil with concentrations exceeding applicable criteria remain at any of these areas.

References:

MACTEC Engineering and Consulting, Inc. (MACTEC), February 2006, *Phase III Investigation Report.*

MACTEC, September 17, 2007, *Remedial Action Report, AOC No. 6, Former Raw Chemical Storage Area*

MACTEC, June 27, 2008, *Quarterly Groundwater Monitoring Report, August 2007 - May 2008.*

MACTEC, February 24, 2009, *2008 Annual RCRA Post-Closure Groundwater Monitoring Report.*

MACTEC, May 2008 through February 2009, Groundwater data.

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4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5 Can the "significant" exposures (identified in #4) be shown to be within acceptable limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

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6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **Former Tri-Star Sports** facility, EPA ID # **CTD052544376,** located at **475 Smith Street, Middletown, CT 06457** under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Prepared by (signature) _____ Date 7/16/09
(print) Stephen R. Walbridge
(title) Principal Scientist – MACTEC Engineering & Consulting, Inc.

DEP reviewed by (signature) _____ Date 7/20/09
(print) SANDY BRUNELLI
(title) ENVIRONMENTAL ANALYST III
(EPA Region or State) CTDEP

DEP Supervisor (signature) _____ Date 7-22-09
(print) DAVID RINGQUIST
(title) Supervising EA
(EPA Region or State) CTDEP

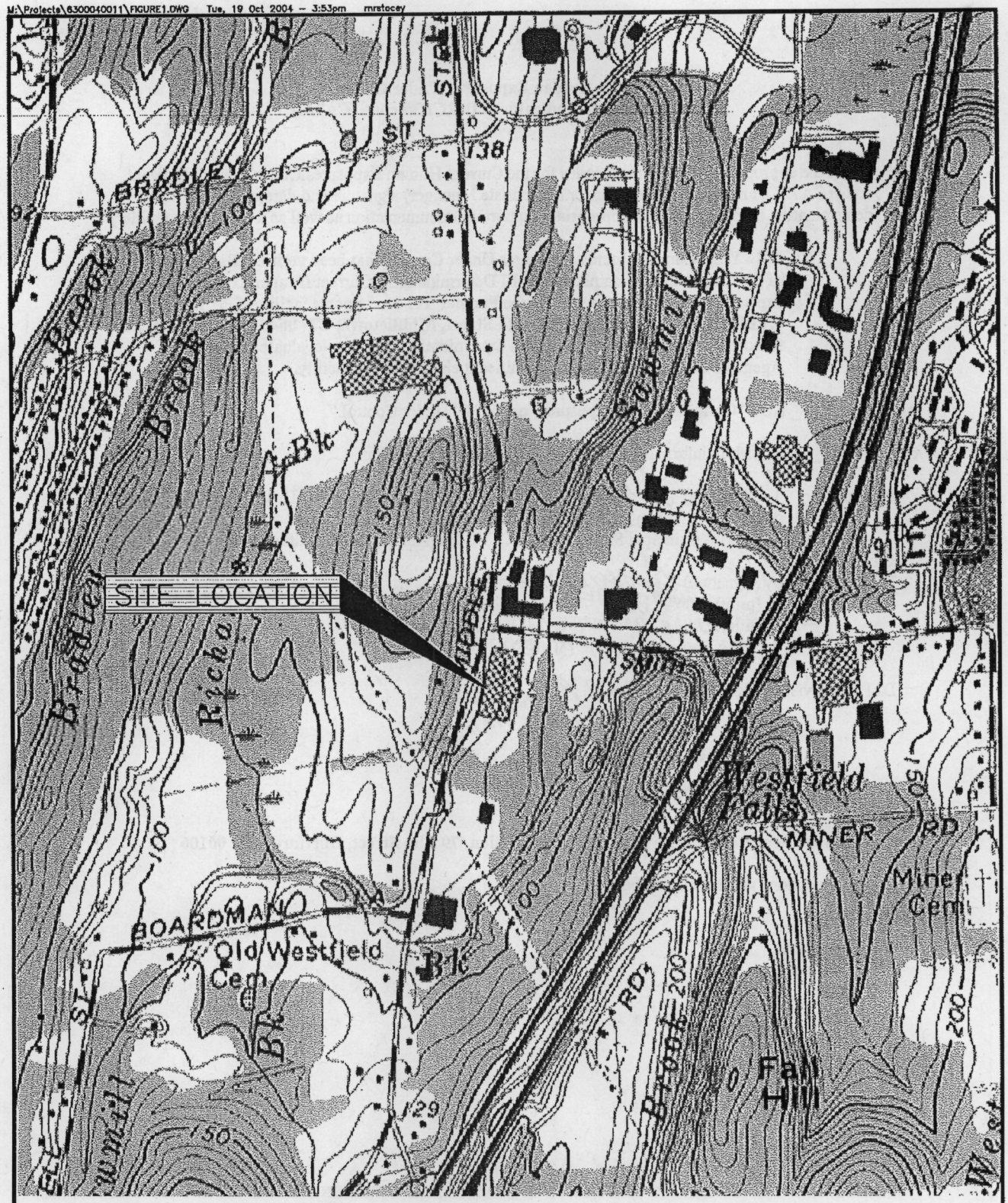
Locations where References may be found:

Connecticut Department of Environmental Protection, 79 Elm Street, Hartford, CT 06106

Contact telephone and e-mail numbers

Name:
Phone:
E-mail:

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.



Quadrangle Source: MAPTEC USGS
Topographic Series Connecticut, Edition 2.0

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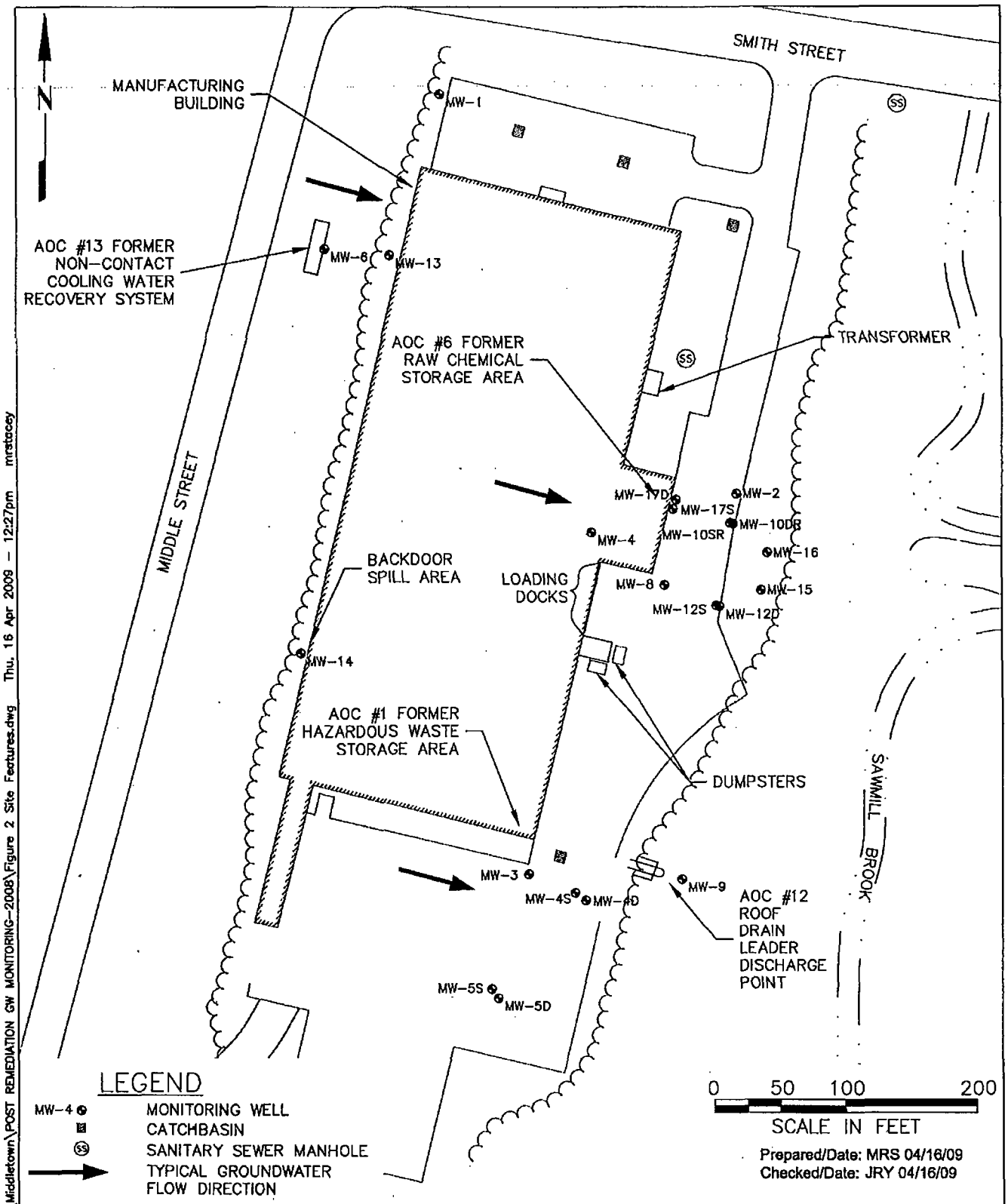
SCALE IN FEET

Prepared by: MRS | Checked by: JRY

FIGURE 1
SITE LOCATION MAP
FORMER TRI-STAR SPORTS FACILITY
475 SMITH STREET
MIDDLETOWN, CONNECTICUT
MACTEC Engineering and Consulting



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FORMER TRI-STAR SPORTS FACILITY
MIDDLETOWN, CONNECTICUT

MACTEC

SITE FEATURES

Project 6107-09-0006
Figure 2